

551.506 (265.2)

NORTH PACIFIC OCEAN

By WILLIS EDWIN HURD

For the first time in many months no reports of fog occurring west of the 180th meridian for a given month have come in from marine observers crossing the North Pacific Ocean. Otherwise, south of the Aleutian Islands, and along the northern and central sailing routes, fog was moderately frequent in December. Along the 5-degree strip, 45° to 50° N., between 180° and the Washington coast, scattered observances of the phenomenon were made on 15 days. Down the American coast to the 28th parallel fog was less frequently reported than in November. In the 5-degree square southwest of Guatemala it occurred on the 5th, 19th, and 20th. The U. S. S. *Sirius* makes the following report of fog in 13° 30' N., 92° 17' W.:

Dec. 5. This heavy fog was preceded by rapid fall in temperature of injection water. At 1 a. m. injection was 84°; 2 a. m., 72°; then a slow decrease to 69° at 8 a. m. It is thought probable this sudden drop in water temperature caused condensation of water vapor into the hotter air and produced the fog. During the occurrence the air temperature was 77° to 86°. This report is particularly submitted since fog appears to be an unusual phenomenon in this vicinity at this period of year.

Gales this month occurred over a wider expanse of the ocean, and were less concentrated as to given area, than is usually observed. In general, however, there was a more southward migration of strong winds, and an unusual number of gales were reported as low as 20° to 25° N. in mid-ocean. Storm to hurricane winds were reported by vessels on the 1st, 11th, 14th, 17th, 21st, and 22d, and hurricane velocities were recorded at the Tatoosh Island Weather Bureau Station on the 19th and 20th.

A rather unusual pressure situation was associated with these conditions. While stable high pressure prevailed over the China coast, and resulted on some days in a strong northeast monsoon current, the wind at times reaching a force of 10, there was a considerable inversion of the pressure elements east of the 180th meridian, and for the middle half of the month the region of the Aleutian Low was covered by an anticyclone, while cyclonic conditions prevailed to the southward. Some idea of this situation may be had by a consideration of the barometric situation at the three island stations of Dutch Harbor, Midway Island, and Honolulu.

The mean pressure for December, 1924, at Dutch Harbor was 29.72 inches, which was 0.17 inch above the normal. From the 1st to the 24th, with the exception of the 6th to 8th, the daily 8 p. m. readings were higher than the average, 30.46 on the 20th being the highest. About the 20th the huge Low that had covered much of middle latitudes for a decade began to forge northeastward toward southwestern Alaska until, on the 25th, pressure fell below normal at Dutch Harbor, reaching its minimum reading of 28.88 on the 29th. At the close of the month the Aleutian Low, so-called, had advanced until all Alaska was under its influence. The pressure extremes at Kodiak were 30.86, on the 20th, and 28.42, on the 8th.

At Midway Island the average 8 p. m. pressure was 29.92 inches, or 0.10 inch below the normal, and 0.28 inch below the average of December, 1923. The daily readings were above normal on eight occasions only, or from the 11th to 15th, and the 29th to 31st. The highest was 30.22, on the 29th and 30th; the lowest, 29.50, on the 22d.

At Honolulu the average pressure was 29.97 inches, as against the normal of 30.02, and the extremes were 30.19,

on the 31st and 29.61 on the 16th. The minimum reading was the third lowest ever made at Honolulu, the absolute lowest being 29.51, in December, 1906. Pressure was below normal except on the 1st to 5th, on the 22d, and from the 26th to 31st. Thus it will be seen that this station was under the influence of the eastern North Pacific anticyclone during the first and last few days of the month, and during most of the other 20 days was in regions of diminished pressure. From the 11th to the 18th of this period an area of low pressure, detached from the principal cyclone, was especially affecting the Hawaiian region. As a consequence, although the prevailing monthly wind was east at Honolulu, yet a kona, or southwest wind, was unusually strong and long-continued. The maximum wind velocity was at the rate of 39 miles an hour from the southwest, on the 17th and 20th. Honolulu's maximum temperature was 83°, on the 1st, which is the highest in December since 1894. The minimum was 61°, on the 13th, the lowest since 1906.

Along the coast of Washington and Oregon precipitation was in excess of the average, and temperatures were below the normal. While, owing to the persistent anticyclone, both precipitation and temperature were generally below normal after the 11th in southeastern Alaskan waters.

The eastern North Pacific HIGH, normally central between Hawaii and California, was subject to great fluctuations, but was well developed near its usual area on the early and last days of the month, and during the high-pressure period over Alaska, extended generally in a ridge down over the eastern waters of the ocean. More frequently than not the crest of the HIGH lay over the American continent.

In the Far East tropical storm development continued light, as in November, with only three typhoons in the two months. On the 3d the American S. S. *President Cleveland* encountered an east-northeast gale, force 10, lowest pressure 29.56, midway between Manila and Hongkong. This seems to have been close to the final record of the typhoon which traversed the Philippines on November 29. The typhoon of December 13-22 is noticed by the Rev. José Coronas in his article entitled "One Typhoon over the Philippines in December, 1924," appearing elsewhere in this issue of the REVIEW.

As usual, the waters of the Gulf of Tehuantepec and neighborhood were disturbed by northerly gales on several days, as experienced by vessels plying to and from Panama.

The attached table gives a good indication of the distribution and force of the December gales. The heavier sea winds recorded occurred, as a rule, to the westward of 180°. On the first and eleventh storm to hurricane winds occurred in connection with cyclonic disturbances east or southeast of Japan. No very low pressures accompanied either, but in the first instance the British S. S. *Canadian Winner* encountered terrific snow and hail squalls in 40° N., 145° E., while in the second the American S. S. *Memphis City* faced a westerly gale of force 11, accompanied by rain, a few miles outside of Yokohama Harbor. On the 14th and 17th storm winds were experienced by vessels south of the western Aleutians, and on the 21st and 22d hurricane blasts occurred in connection with moderately shallow pressures near 33° N., 160° to 165° E.

It is frequently noticeable that only fresh to strong gales occur, or at least are observed, coincident with the lowest pressure readings in the huge Pacific cyclones. Thus, in the table, we see the American S. S. *President Harrison* encountering a hurricane, lowest observed

pressure 29.38, in 33° N., 160° E., on the 22d, while vessels in the Aleutian region toward the center of the great winter low experienced pressures much lower than 29 inches, with only moderate winds. The lowest pressure recorded in these waters by a vessel this month was 28.46 inches, read on board the Japanese S. S. *Ibukisan Maru*, in 47° 45' N., 165° 20' W., on the 29th, highest wind force 9 SW. Of course steepness of pressure gradient in large measure determined the relative strength of these winds.

NOTE

American S. S. *Pacific*, Puget Sound southward.—December 6, latitude 47° 10' N., longitude 124° 33' W. Sighted moderate waterspout about 2 miles to westward.

ONE TYPHOON OVER THE PHILIPPINES IN DECEMBER, 1924

By REV. JOSÉ CORONAS, S. J.

[Weather Bureau, Manila, P. I.]

There has been only one really well-developed typhoon in the Far East during this month of December; and this is the one that traversed the central part of the Philippines on the 19th and 20th and influenced the weather in most of our southern stations for eight or more successive days. Heavy, prolonged rains with destructive floods have been reported, particularly from places in Surigao, Cebu, Samar, and Leyte provinces. Great landslides have been also reported as an effect of heavy continuous rains in the Province of Surigao. Our observer at Surigao has reported the following daily amounts of rain in that place for the period of December 11 to 15, the heavy rains having begun even two days before the typhoon was noticed to the east of Surigao: December 11, 190.6 millimeters (7.50 inches); December 12, 183.5 millimeters (7.23 inches); December 13, 223.1 millimeters (8.78 inches); December 14, 328.9 millimeters (12.95 inches); December 15, 93.9 millimeters (3.70 inches); total in five days, 1,020 millimeters (40.16 inches).

551.506(73) DETAILS OF THE WEATHER IN THE UNITED STATES

GENERAL CONDITIONS

ALFRED J. HENRY

Practically a normal month up to the 18th when a southward flow of cold air from high latitudes set in, culminating on the 21st in extraordinarily high pressure over the Rocky Mountain and Plateau regions. The effect of the high pressure and associated low temperature was felt until about the end of the month. The usual details follow:

CYCLONES AND ANTICYCLONES

By W. P. DAY

The barometric pressure was abnormally high over Alaska from the 12th until the 28th, reaching its first great maximum on the 14th at Eagle. Meanwhile, this condition spread southeastward and reached Alberta on the 15th and carried as far as the lower Missouri Valley. With one or two interruptions the Alaska high spread slowly southeastward until by the 21st there was one area of continuously high pressure extending from the northwestern limits of Alaska to the Atlantic coast. The southeastward movement of this great mass of cold air

The typhoon was first shown by our weather maps on December 13, between Yap and Mindanao, not far from 133° longitude E., between 9° and 10° latitude N. It moved probably west by north until the 15th, when it inclined northward near to the east of Surigao Strait. Then it remained almost stationary, or continued moving very slowly in the 16th, 17th, and part of the 18th, until finally in the afternoon of the 18th it inclined decidedly to the west.

On the 19th warnings were sent to the effect that the typhoon was moving practically west from the Strait of San Bernardino, threatening Romblon and Mindoro. In fact, the center passed over San Bernardino Strait, where the vortical calm was observed on board the steamer *Ulyses* (barometric minimum 742 millimeters, 29.21 inches, shortly after noon of December 19; and over Romblon, where absolute calm was also reported by our observer at 8 a. m. of December 20. The rate of progress of the typhoon was of about only 6 to 7 miles per hour on the 19th and 20th.

In the China Sea the typhoon continued moving west until the afternoon of the 21st, when it inclined to west-northwest. In the afternoon of the 22d the center was situated in about 115° longitude E and 14° latitude N., where it has at this writing (December 25) remained almost stationary for about two days, probably filling up gradually.

The position of the center at 2 p. m. of December 19, 20, and 21, and 6 a. m. of December 20, 21, and 22, was as follows:

December 19, 2 p. m., 124° 10' longitude E., 12° 40' latitude N.

December 20, 6 a. m., 122° 25' longitude E., 12° 40' latitude N.

December 20, 2 p. m., 121° 35' longitude E., 12° 40' latitude N.

December 21, 6 a. m., 119° 05' longitude E., 12° 45' latitude N.

December 21, 2 p. m., 117° 25' longitude E., 12° 50' latitude N.

December 22, 6 a. m., 116° 10' longitude E., 13° 15' latitude N.

had been retarded by the persistence of high pressure extending westward from Bermuda, but it finally prevailed. Following the breaking down of the area over the United States on the 23d, three more important highs from the parent high in Alaska appeared in the northwest before the close of the month. The large area covered by the individual highs prevented their being so numerous as in the preceding month.

The low-pressure areas after the 15th followed the southern circuit, or appeared first in northern Manitoba. They were less numerous than in November.

FREE-AIR SUMMARY

By V. E. JAKL

It will be noted from Table 1 that there was a pronounced deficiency in temperature at all aerological stations, except Due West, where about normal temperatures prevailed. The departures in the levels near the ground are in agreement with Chart 111, which shows that the greatest fall in temperature below the normal occurred over the Northwestern States. A closer inspection of Table 1 shows that the negative departures diminished in magnitude with increasing altitude, except that